pieces of a large stone; *b*, average of two analyses by Nordenskjöld of whole stones, weighing 1,063 and 0·64 grm.

VIII. Orvinio, 1872, August 31, analysed by L. Sipöez. *a*, chrondritic ground-mass; *b*, black connecting mass.

IX. Ställdalen, 1876, June 28, grey ground mass, analysed by G. Lindström.

*Composition of Meteorites, excluding the Oxygen, Sulphur, Phosphorus, and Chlorine found in them.*

| | Si. | Mg. | Fe. | Ni. | Co. | Mn. | Ca. | Al. | Na. | K. | Cr. | Sn. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I. | 26·11 | 21·79 | 44·29 | 2·43 | — | 0·83 | 2·13 | 1·31 | 0·85 | — | 0·26 | — |
| II. | 26·70 | 23·61 | 42·90 | 2·68 | — | 0·66 | trace | 2·12 | 0·83 | trace | 0·50 | — |
| III. | 26·91 | 23·22 | 43·12 | 1·59 | 0·09 | 0·56 | 1·02 | 1·85 | 0·85 | 0·25 | 0·42 | 0·12 |
| IV. | 26·12 | 21·52 | 47·82 | 2·75 | — | 0·18 | — | 0·23 | 1·12[1] | — | 0·26 | — |
| V. | 28·02 | 22·09 | 42·99 | 2·92 | — | 0·01 | 0·53 | 2·07 | 0·39 | 0·31 | 0·53 | 0·14 |
| VI. | 27·55 | 20·45 | 44·74 | 1·58 | — | 0·44 | 2·09 | 0·70 | 0·72 | 0·66 | 1·07 | — |
| VII. *a*. | 26·26 | 21·28 | 43·57 | 3·29 | 0·03 | 0·50 | 1·97 | 1·94 | 1·05 | — | 0·08 | 0·03 |
| *b*. | 26·43 | 23·07 | 41·37 | 3·30 | trace | trace | 2·28 | 1·27 | 1·78 | — | 0·49 | 0·01 |
| VIII. *a*. | 26·09 | 21·28 | 43·29 | 3·16 | — | — | 2·46 | 1·75 | 1·59 | 0·38 | — | — |
| *b*. | 26·65 | 20·18 | 42·55 | 4·71 | — | — | 2·56 | 1·91 | 1·10 | 0·34 | — | — |
| IX. | 25·66 | 21·41 | 44·83 | 2·73 | 0·26 | 0·29 | 1·77 | 1·74 | 0·71 | 0·18 | 0·42 | — |

Every one who has had experience of the analytical examination of meteorites, which is often very difficult, or at least tedious, writes Prof. Nordenskjöld, and who knows the difficulty of obtaining any proper average sample on account of the preciousness of the material, will perhaps see that here the question is no longer concerning an accidental similarity in the figures obtained, but an actual identity, showing that all those meteorites which have fallen in the course of more than fifty years form a natural group having a common origin. I have not yet been able to treat in the same way all the accessible analyses which, when those that are quite trustworthy are only in question, are less numerous than is commonly supposed. I consider it certain that it will be possible to arrange several other similar natural groups, and that very many other meteorites than those here enumerated belong to this group, which perhaps may be called Hessleites after the most abundant, most completely examined and analysed meteor fall.

It appears to me highly probable that all Hessleites belonged either in a completely metallic or in a *fully* oxidised condition to the same swarm of meteors revolving in our solar system, and that the differences in composition now exhibited by the meteorites belonging to the same group depend on changes to which the meteorites were afterwards subjected by being heated under the influence of oxidising or reducing substances.

With respect to the group now in question it is clear, from the microscopic structure of these meteorites, that the metallic iron forms their most recent constituent, and that it has thus arisen through reduction of the ferriferous silicates.

Where has this reduction proceeded? Probably not in the atmosphere of our globe, though the carboniferous substances which occur in a great number of fire-balls may very well form the necessary reduction material; possibly on the exploded heavenly body, of which these meteorites, according to a sufficiently hazardous and probably incorrect hypothesis, may form fragments; most probably, perhaps, in passing the perihelion, during the revolution of the meteor swarm round the sun.

That, besides, both reducing and oxidising influences, if on a smaller scale, make themselves felt during the short path of the meteors in our atmosphere, is shown on the one hand by the shining iron particles which are often found on the surface of the meteorites, and on the other hand by a comparison of the analyses of the large and small meteorites from Hessle; for while the large contain a considerable quantity of sulphur (1·88 per cent.), the small are nearly free of it (containing only 0·18 per cent.), clearly for the reason that the sulphur in them has been oxidised and driven off.

## UNIVERSITY AND EDUCATIONAL INTELLIGENCE

FROM the Twenty-fifth Report of the Science and Art Department, we learn that the number of schools examined in 1877 was 1,348, the number of pupils under instruction being 55,927. These numbers are smaller than in 1876. This decrease was entirely due to the withdrawal of physical geography from the list of subjects for which aid is given; for in the remaining subjects a substantial increase had taken place. The subject added to the list when physical geography was withdrawn, viz., physiography, has already secured a large amount of attention; and it is probable that no less than 5,000 candidates will present themselves for examination in it in May next. The above-mentioned 1,348 schools comprised 4,635 different classes, from which 32,112 students came up for examination in May, in addition to 3,230 self-taught students and pupils in classes not taught by certificated teachers. From the results of the examination it is seen that the number of papers passed compares favourably with the statistics of previous years. The number of candidates who came up in honours was 1,029, of whom 85 passed in the first class and 192 in the second class. From the reports on the general character of the examinations which have been received from the examiners, it appears that the results of the examinations are generally of an encouraging nature. Some of these reports contain very valuable suggestions as to methods of teaching, &c., and they have been printed and circulated among the schools. The number of competitors for Whitworth Scholarships in 1877 was sixty-eight. Of these nineteen of the most successful in the theoretical subjects of competition were admitted to go forward to the examination in practical workmanship, which was as in previous years, held at the workshops of Sir J. Whitworth and Co., in Manchester. The Committee of Council state that they have received from the Council of the Royal Society a report of the work done by the gentlemen to whom grants had been made during the year 1877–78 out of the vote of 4,000*l.* for research. This vote was first made in the year 1876–77, the correspondence with reference to it being given in our last, the Twenty-fourth Report, at p. 7 of the Appendix. But owing to the period of the year at which the vote was finally sanctioned, the recommendation of the Council of the Royal Society was not received till March 16, 1877, and only 2,195*l.* 1*s.* 6*d.* came into payment out of that vote, the remainder being returned to the Exchequer. Considering the nature of these inquiries and the time necessarily devoted to preliminary experiments, it was not to be supposed that there would be much definite result to show in the first year. But on the whole very satisfactory progress has been made, and much good work already accomplished, several valuable papers having been contributed to the Royal Society.

WE would draw the attention of teachers in London and its neighbourhood to the admirably organised teachers' classes at St. Thomas Charterhouse School of Science. The session commences on the 28th inst., and those wishing for information should apply to the organising secretary, Mr. C. Smith, at St. Thomas Charterhouse Schools, Goswell Road.

AT a recent meeting of the council of the Yorkshire College, the following appointments were made:—As Lecturer in German and Oriental Languages, Joseph Strauss, Ph.D.; as Lecturer in French, John Willis, Ph.D. Both the new lecturers will commence their duties with the coming session, in October.

WE have received a very elaborate programme of the mathematical courses for the session 1878-9, under Prof. Sylvester, at Johns Hopkins University, Baltimore. Other circulars give a similar announcement in respect to the courses to be followed in languages, chemistry, physics, and biology.

THE University of Helsingfors will celebrate the fiftieth year of its existence during this autumn. The Finlandic University was originally at Abo, and was transferred to Helsingfors in 1828.

THE University of Zürich has just bestowed the title of Doctor of Jurisprudence on a young Russian lady, who obtained the highest honours in her examination for this degree.

AN institution for the higher education of ladies will shortly be opened at Kieff.

## SOCIETIES AND ACADEMIES

### LONDON

Entomological Society, August 7.—H. W. Bates, F.L.S., F.Z.S., president, in the chair.—A communication was read from Mr. M'Lachlan to the effect that, in the writer's opinion, the larva referred to by Prof. Westwood at the last meeting of the society, as boring in the stems of the potato, was in all probability that of a *Noctua-Gortyna flavago*, polyphagous in the stems of a variety of herbaceous plants.—Mr. S. Stevens exhibited some living specimens of *Teretrius picipes*, parasitic on

[1] And potash.

*Lyctus oblongus*, and also specimens of *Pachnobia alpina*, bred from pupæ found on the highest parts of mountains about Rannoch, N.B.—Mr. Enoch exhibited some remarkable varieties of British lepidoptera.—Mr. Rutherford exhibited some living specimens of an ichneumon (identified by Mr. F. Smith as *Cryphus formosus*), parasitical on the larvæ of a West African moth, allied to *Anapha panda*.—Mr. Rutherford also exhibited a series of colour varieties of the African butterfly, *Aterica meleagris*, as illustrative of the principles of protective assimilation and of some remarks he contributed thereon.—Mr. Jenner Weir exhibited five remarkable specimens of *Argynnis paphia*, and contributed some remarks on melanic variation in that species.—Mr. Wood Mason read a paper on the difference between the form of the antennæ in the males of *Idolomorpha* and other genera of *Empusidæ*, a sub-family of Mantidæ.—Mr. Dunning read a paper on the genus *Acentropus*.—The following papers were also communicated:—Descriptions of several new species of myriopoda of the genera *Sphærotherium* and *Zephronia*, by Mr. Butler; and descriptions of new genera and species of South American *Eumolpidæ*, chiefly from the Amazon region, by Mr. Baly.

GENEVA

**Physical and Natural History Society**, February 21.—Prof. Marignac having transformed into nitrates the gadolinite earths for the purpose of decomposing them afterwards by heat, obtained, after many successive experiments, products more and more pure, showing the existence of a third earth—terbene. The yellow tint of its oxide does not result from the presence of didymium in this oxide.—Prof. Soret described the principal results of his researches on the ultra-violet absorption spectra. Most of these spectra are continuous up to a given line, from which the radiations are more and more obstructed. The bases and the acids generally carry their absorbent properties into the salts which they compose.

March 21.—Prof. Alph. de Candolle read a memoir on the appearance and the falling of leaves of trees. He was not able to discover any direct and regular connection between the periods of the two phenomena. Among the species seen, individuals present great differences in this respect; we find sometimes that individuals earliest to get their leaves in spring are latest in autumn to lose them, but the exceptions to this rule are numerous. One specimen presenting singularities in this respect preserves, in general, its qualities from year to year (see *Arch. des Sc.*, t. lxii. p. 143).—Prof. Brun spoke of the causes of the movement and of the different modes of reproduction of diatomaceous algæ, which multiply by subdivision and by spores, and which live in the most diversely situated localities in the Sahara, as at altitudes of 2,600 metres in the Alps.

April 4.—Prof. F. A. Forel has studied the sculptured pebbles on the strands of the Lake of Geneva. Some are incised by a larva of the species *Hydropsyche*, others are covered with a tufoid incrustation, underneath which the calcareous stones are deeply sculptured. The incrustation results from the action of two algæ, *Enactis calcivora* and *Hydrocoleum calcilegum*.—M. Victor Fatio presented the report printed by him on the International Congress on Phylloxera at Lausanne, entitled "State of the Phylloxera Question in Europe in 1877."

April 18.—M. Alph. Favre read a note on the mode of formation of some stratified mountains and some valleys, which he explained by the ramming or lateral crushing of the geological strata. He has made experiments tending to prove his theory, by means of caoutchouc stretched out and covered with potter's clay, left to contract gradually. (*Arch. des Sc.*, t. lxii. p. 193.)—Prof. Soret, by means of the observation of the ultra-violet absorption spectra of gadolinite earths, has confirmed the conclusions of M. Marignac and M. Delafontaine on the existence of terbene and of another yellow earth besides terbene and yttria.—M. Arthur Achard indicated a peculiarity in the action exercised by a magnetic pole in a circular closed current. If we imagine the pole approaching nearer and nearer the plane of circumference by projecting beyond the latter, there will be an angular situation for which the component perpendicular to the plane of the current, from the action exercised by the pole on the latter, changes its sign. It follows that two opposite poles, the one on this side, the other on that of the situation thus defined, will exercise on one and the same circular current concordant actions.

PARIS

**Academy of Sciences**, August 26.—M. Fizeau in the chair.—The following, among other papers, were read:—Employment of the right ascension of the moon, corrected from tabular errors, for determining longitude at sea, by M. Faye. He indicates some modifications by which the errors in Hansen's tables may be corrected.—Comparison between the salivary and the sudoriparous glands, relatively to the way in which they are affected by section of their excito-secretory nerves, by M. Vulpian. Jaborandi still acts on the sub-maxillary gland several days after section of the excito-salivary nerves, whereas this plant, or its alkaloid, pilocarpine, from the sixth day after section of the sciatic nerve (which seems to contain all the excito-sudoral fibres of the posterior limb), has no longer action on the sudoriparous glands of the corresponding limb. M. Vulpian thinks the probable reason for the dissimilarity lies in the enormous quantities of nerve-cells, isolated, or in ganglionic groups, distributed throughout the secretory nerves which go to the sub-maxillary gland. These, after section of the nerves, probably prevent the fibres gradually losing their excitability as far as their peripheric extremities.—On the vibratory forms of solid and liquid bodies (third memoir), by M. Decharme. He finds that on circular plates (thrown into vibration) the breadths of the striæ are inversely proportional to the square roots of the numbers of vibrations of the corresponding sounds.—On pelletierine, an alkali from the bark of the pomegranate, by M. Tanret. Its mode of preparation and its properties are described; also the proportions got from the bark of different parts (most is got from the dry roots). Pelletierine is the tænicide principle of the pomegranate, not previously isolated.—Researches on strychnine, by MM. Gal and Etard. By causing hydrated baryta to act on strychnine under certain conditions, two new bases were obtained: they are called respectively, *dihydrostrychnine* and *trihydrostrychnine*.—Researches on the relations existing between the weights of the bones of the skeleton of a buffalo, by M. de Luca. The entire skeleton weighs about 29 kilogs. The lower jaw weighs a fifth of the cranium; the head (without lower jaw) as much as the vertebral column; the pelvis four times the sacrum; the bones of the head a fourth of the skeleton, the cervical vertebræ, the dorsal, and the lumbar, with sacrum and caudal vertebræ, about equal; the bones of the two anterior limbs double the posterior; the bones of the right side weigh more than the corresponding bones of the left. Of the vertebræ the atlas weighs most; the weight then diminishes on to the last dorsal, then increases and is stationary in the lumbar vertebræ; in the caudal the weight diminishes progressively, &c.

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